II. REJECTIONS OF CLAIMS 1-30 UNDER 35 U.S.C. § 103

Claims 1-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,052,375 ("Bass") in view of U.S. Patent No. 5,463,620 ("Sriram"). It is respectfully submitted that the cited references, whether considered alone or in combination, do not render the claimed invention obvious for at least the following reasons.

The claimed invention relates to apparatus/methods for controlling data flow through a network using a plurality of time-based queues. Independent claims 1, 12, 15, 25, 28, and 30 require that "each time-based queue is set to dequeue all of its contents at a separate time." See, for example, page 2, line 21 - page 3, line 2; and page 5, line 24 - page 6, line 10 of the present specification.

As the Examiner concedes in the Office Action, the Bass patent does not teach or suggest the above-identified feature recited in independent claims 1, 12, 15, 25, 28, and 30. The Examiner cited the Sriram patent as teaching that "each time-based queue is set to dequeue all of its contents at a separate time." In this regard, the Examiner cites column 6, lines 20-31 of the Sriram patent. This portion of the patent has been studied and discussed by the Examiner via telephone. It is respectfully submitted that the Sriram patent fails to reasonably suggest the limitation in question.

> The server 48 in effect defines a cycle time period D_c during which it will retrieve cells from all of the queues having cells to send. The server 48 divides the cycle time period into time slices T_1, T_2, . . . T_n, assigns a time slice to each of the queues, and permits each queue to empty cells onto the output link 28 during its respective time slice. The server 48 accomplishes this by visiting each queue in sequence, removing a predetermined number of cells from each queue, and then moving on to remove a predetermined number of cells from the next queue in sequence. All queues are visited within the next cycle time period D_c defined by the server 48. (Sriram, column 6, lines 20-31.)

It is not seen how this passage supports the Examiner's contention that the Sriram patent discloses a system in which a queue is set to dequeue all of its contents at a particular time. The passage does indicate that during a particular time period Dc, a server will retrieve cells from *all* queues having cells to send. However, nothing in the passage suggests that any particular queue will have all of its cells ready to send. Possibly, the Examiner views Sriram's mention of "removing a predetermined number of cells from each queue" (Sriram, column 6, lines 27-28) as meeting the claimed limitation. It is respectfully submitted that removing a predetermined number of cells in no way suggests removing *all* cells. To the contrary, a "predetermined number" suggests a limited number, that is independent of any knowledge of how many cells are in a particular queue at a particular time. Other passages confirm this.

The Sriram patent describes a dynamic time slice (DTS) server. The DTS server 48 withdraws cells from a plurality of queues 32, 34, 36, ... (FIG. 5). As mentioned, the DTS server 48 defines a predetermined cycle time Dc. During this cycle time Dc, the server 48 visits each of the queues 32, 34, 36, ... , withdraws a predetermined number of ATM cells from each queue, and transfers that predetermined number of cells onto an output link 28 (column 5, lines 35-39).

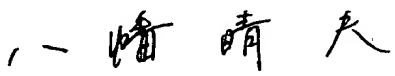
For example, during each cycle time period, the DTS server 48 withdraws thirty cells from the voice queue 32 on the line 33, and sixty cells from CBR video queue 36 on line 37, etc. As described throughout the Sriram patent, the number of the cells withdrawn from each queue during each cycle time is "predetermined" (e.g., column 5, lines 53-56). In most cases, the server 48 continues to visit each of the queues for a plurality of times and each time withdrawing the predetermined number of cells onto the output link 28. See, column 6, lines 31-34, "the server 48 repeats the cycle of visiting each queue ... and removing respective predetermined numbers of cells." In the Sriram patent, no queue "is *set* to dequeue all of its contents" as recited in independent claims. Rather, the Sriram queues are *set* to dequeue a number cells that is wholly independent of the number currently in the queue.

For at least the reasons set forth above, independent claims 1, 12, 15, 25, 28, and 30, and their dependent claims are believed to be patentable over the cited art. Withdrawal of the rejections is respectfully requested.

III. CONCLUSION

Applicants believe that all pending claims are in condition for allowance, and respectfully request a Notice of Allowance at an early date. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 510-843-6200.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



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APPENDIX – CLEAN VERSION OF PENDING CLAIMS

1. (Previously Amended) An apparatus for controlling data flow through a network, the apparatus comprising:

one or more processors;

memory coupled to at least one of the one or more processors; and

a plurality of time-based queues logically configured on the memory and together defining a period of time with each time-based queue defining a separate increment of time within the period of time, whereby each time-based queue is set to dequeue all of its contents at a separate time,

wherein the processor is configured or designed to direct (i) data or (ii) grants to transmit data to particular time-based queues based upon network traffic shaping delays prescribed for the data or grants to transmit the data.

2. The apparatus of claim 1, wherein the apparatus is a router.

3. The apparatus of claim 1, wherein the apparatus is a cable modem termination system.

4. The apparatus of claim 1, wherein the separate increments of time defined by the time-based queues are each of the same length.

5. The apparatus of claim 1, wherein the separate increments of time defined by the time-based queues are configurable.

6. The apparatus of claim 1, wherein the period of time defined by the plurality of time-based queues are configurable.

7. The apparatus of claim 1, wherein the one or more processors are further configured or designed to determine network traffic shaping delay.

8. The apparatus of claim 1, wherein the one or more processors are further configured or designed to discard data or a request to grant transmission of data if a network traffic shaping delay is greater than the period of time defined by the plurality of time-based queues.

9. The apparatus of claim 1, wherein the one or more processors are further configured or designed to transmit, without buffering in a time-based queue, the data or issue grants to transmit data if there is no network traffic shaping delay.

10. The apparatus of claim 1, wherein the one or more processors are further configured or designed to direct network packets of varying sizes to the time-based queues.

11. The apparatus of claim 1, wherein the apparatus is configured or designed to simultaneously buffer, in a single time-based queue, data or grants to transmit data from a plurality of network nodes.

12. (Previously Amended) An apparatus for controlling data flow through a network, the apparatus comprising:

traffic shaping means for determining how long to buffer data or grants to transmit data; and

buffering means for buffering the data or grants to transmit data in a plurality of time-based queues together defining a period of time, with each time-based queue defining a separate increment of time within the period of time, whereby each time-based queue is set to dequeue all of its contents at a separate time.

13. The apparatus of claim 12, wherein the traffic shaping means also directs the data or grant to transmit data to particular time-based queues based upon a determined length of time for buffering.

14. The apparatus of claim 12, further comprising a policing means for determining whether to buffer the data or grants to transmit data.

15. (Previously Amended) A method of controlling data flow through a network, the method comprising:

determining that transmitting additional data to or from a network node will or will likely exceed a maximum allowed data flow for the network node;

selecting one of a plurality of time-based queues that together define a period of time, with each time-based queue defining a separate increment of time within the time period, whereby each time-based queue is set to dequeue all of its contents at a separate time associated with its increment of time; and

buffering the additional data or a grant to transmit the additional data in the selected one of the plurality of time-based queues.

16. The method of claim 15, further comprising receiving data addressed to the network node prior to determining that transmitting additional data will or will likely exceed the maximum allowed data flow, and wherein the data addressed to the network node is the additional data.

17. The method of claim 15, further comprising receiving data sent by the network node prior to determining that transmitting the additional data will or will likely exceed the maximum allowed data flow, and wherein the data sent by the network node is the additional data.

18. The method of claim 15, further comprising calculating a network capacity used by the network node if the additional data was to be transmitted, the calculation being performed prior to determining that transmitting the additional data will or will likely exceed the maximum allowed data flow.

19. The method of claim15, further comprising determining a delay until the additional data can be transmitted, wherein the determined delay is used to select the time-based queue.

20. The method of claim 19, wherein the time-based queue is selected by matching its time to dequeue with the delay determined for the additional data.

21. The method of claim 15, further comprising:

dequeuing the additional data; and

transmitting the additional data without exceeding the maximum allowed data flow for the network.

22. The method of claim 15, further comprising:

receiving new data that does not form part of the additional data;

determining that transmitting the new data will or will likely exceed the maximum allowed data flow;

determining a delay until the new data can be transmitted without exceeding the maximum allowed data flow for the network node; and

determining that the delay is sufficiently long that the new data is discarded without buffering in the time-based queues.

23. The method of claim 15, wherein the separate increments of time defined by the time-based queues are each of the same size.

24. The method of claim 15, wherein the increments of time defined by the time-based queues are configurable, and wherein the period of time defined by the plurality of time-based queues is configurable.

25. (Previously Amended) A computer program product comprising a machine-readable medium on which are stored program instructions for controlling data flow through a network, the program instructions comprising:

determining that transmitting additional data to or from a network node will or will likely exceed a maximum allowed data flow for the network node;

selecting one of a plurality of time-based queues that together define a period of time, with each time-based queue defining a separate increment of time within the time period, whereby each time-based queue is set to dequeue all of its contents at a separate time associated with its increment of time; and

buffering the additional data or a grant to transmit the additional data in the selected one of the plurality of time-based queues.

26. The computer program product of claim 25, further comprising program instructions for calculating a network capacity used by the network node if the additional data was to be transmitted, the calculation being performed prior to determining that transmitting the additional data will or will likely exceed the maximum allowed data flow.

27. The computer program product of claim 25, further comprising program instructions for:

receiving new data that does not form part of the additional data;

determining that transmitting the new data will or will likely exceed the maximum allowed data flow;

determining a delay until the new data can be transmitted without exceeding the maximum allowed data flow for the network node; and

determining that the delay is sufficiently long that the new data is discarded without buffering in the time-based queues.

28. (Previously Amended) A computer program product comprising a machine readable medium on which is provided program instructions for controlling data flow through a network, the program instructions comprising:

program code for determining that transmitting additional data to or from a network node will or will likely exceed a maximum allowed data flow for the network node;

program code for selecting one of a plurality of time-based queues that together define a period of time, with each time-based queue defining a separate increment of time within the time period, whereby each time-based queue is set to dequeue all of its contents at a separate time associated with its increment of time; and

program code for buffering the additional data or a grant to transmit the additional data in the selected one of the plurality of time-based queues.

29. (Canceled)

30. (Previously Amended) An apparatus for controlling data flow through a network, the apparatus comprising:

means for determining that transmitting additional data to or from a network node will or will likely exceed a maximum allowed data flow for the network node;

means for selecting one of a plurality of time-based queues that together define a period of time, with each time-based queue defining a separate increment of time within the time period, whereby each time-based queue is set to dequeue all of its contents at a separate time associated with its increment of time; and

means for buffering the additional data or a grant to transmit the additional data in the selected one of the plurality of time-based queues.